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EXAMINER

VERBITSKY, GAIL KAPLAN

ART UNIT

PAPER NUMBER

2859

DATE MAILED: 12/05/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.  
09/176,580

Applicant(s)  
Sundaram et al.

Examiner  
Gail Verbitsky

Art Unit  
2859



-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on Sep 11, 2002
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 2, 4-7, 9-16, 18, 20, 21, and 23-27 is/are pending in the application.
- 4a) Of the above, claim(s) \_\_\_\_\_ is/are withdrawn from consideration
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 2, 4-7, 9-12, 14-16, 20, and 23-27 is/are rejected.
- 7) ☒ Claim(s) 13, 18, and 21 is/are objected to.
- 8) ☐ Claims \_\_\_\_\_ are subject to restriction and/or election requirement

## Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on Sept. 11, 2002 is: a) ☒ approved b) ☐ disapproved by the Examiner  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some\* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\*See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s). \_\_\_\_\_ 6) ☐ Other: \_\_\_\_\_

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## DETAILED ACTION

### *Specification*

1. The disclosure is finally objected to because of the following informalities: a brief description of Fig. 10 should be added in page 5 of the specification.

### *Claim Rejections - 35 USC § 102*

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

3. Claims 2, 4-6 are rejected under 35 U.S.C. 102(e) as being anticipated by Boutaghou.

Boutaghou discloses in Figs. 1-4 and 13 a thermal asperity sensor comprising a slider body 12 having a leading edge A, transducers (magnetoresistive sensors/ MR) 18 spaced apart along the length of rails (elevated/ raised bearing surface) 26 of an air bearing surface 14 ABS (col. 6, lines 6-7 and Fig. 1). Each transducer has layers, thus, constituting a thin (having thickness/ height) flat (col. 7, line 20) asperity contacting surface (length) oriented along the ABS. As shown in Fig. 1, the transducers are oriented along (portion extending) the ABS. Inherently, the thickness of the transducer is intersecting (contacting) with its portion

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extending along the ABS. (The numerals A- B have been added by the Examiner, see attachment to the Office Action).

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 9-11, 14-16, 23, 25, 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boutaghou et al. '184 [hereinafter Boutaghou].

Boutaghou discloses in Figs. 1-4 and 13 a thermal asperity sensor comprising a slider body 12 having a leading edge A, transducers (magnetoresistive sensors/ MR) 18 spaced apart along the length of rails (elevated/ raised bearing surface) 26 of an air bearing surface 14 ABS (col. 6, lines 6-7 and Fig. 1), a control circuitry (glide test system) for moving a head and lifting it above a disc/ surface of interest (col. 1, lines 27-30). The leading edge is generally transverse (in this case perpendicular) to the ABS. The ABS also has a recessed surface B (Fig. 13). The transducers 18 are coupled to a peak circuitry 25 detecting a voltage spike indicative of a "thermal asperity" on the disc through bond pads (physical contact) or terminals (conductive strips) on a surface of the slider body 12 (col. 3, lines 36-38 and 56-58) and being capable to detect PZT excitation or other signals (col. 3, lines 43-45). The MR are fabricated by a known

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technique from NiFe (col. 3, line 23) by deposition of very thin, as known in the art (col. 4, lines 8-9), layers, thus, constituting a thin (having thickness) flat (col. 7, line 20) asperity contacting surface oriented along the ABS. Boutaghou also states that, during the fabrication process, portions of rails act as substrates 28 upon which sensor layers 18 are deposited (col. 3, lines 56-58). Since the rails are formed on the ABS (Fig. 2), inherently, it is expected that the ABS be configured prior to the deposition process. As shown in Fig. 1, the transducers are oriented along (portion extending) the ABS. Inherently, the thickness of the transducer is intersecting with its portion extending along the ABS. (The numerals A- B have been added by the Examiner, see attachment to the Office Action). In a broad sense, Boutaghou discloses that the pads are proximate to the trailing edge because as shown in the drawings, the transducers are close to the trailing edge.

Boutaghou does not explicitly disclose the particular size of the transducers and other limitations of claims 9-11, 14-16, 23-25, 27.

With respect to the particular size of the transducers (how far the transducers extend on the slider), as stated in claims 9 and 10: the particular size of the transducers, absent any criticality, is only considered to be the "optimum" size of the transducers in the device disclosed by Boutaghou that a person having ordinary skill in the art would have been able to determine using routine experimentation based; among other things, on the size of the device, etc. In re Boesch, 205 USPQ 215 (CCPA 1980). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device disclosed by Boutaghou

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so as to extend the thermal transducers to possibly occupy the surface between the trailing and the leading edges in order to allow better contact with the surface of interest in order to achieve more accurate results.

With respect to claim 16: the method steps will be met during the normal manufacturing of the device stated above.

6. Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Boutaghou as applied to claims 9-11, 14-16, 23, 25, 27 above, and further in view of Yura.

Boutaghou discloses a device as stated above in paragraph 5.

Boutaghou does not explicitly disclose depositing thermal transducers prior (before) to slicing a wafer.

Yura teaches in Fig. 5 to attach structures (head elements 2) to raised bearing surfaces of a slider wafer before (prior to) slicing the wafer onto glide bodies. Yura also shows fabricating a raised bearing surface and a recessed surface on each glide body of the plurality of glide bodies.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device disclosed by Boutaghou so as to deposit transducers (structures) onto the bearing surface before slicing individual glide bodies, as taught by Yura, in order to reduce the manufacturing costs by limiting a number of individual depositing.

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7. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Boutaghou as applied to claims 9-11, 14-16, 23, 25, 27 above, and further in view of Padovani et al. (U.S. 5372427) [hereinafter Padovani].

Boutaghou discloses the device as stated above in paragraph 5.

Boutaghou does not disclose the limitations of claim 7.

Padovani discloses in Fig. 1 a device comprises a thermally sensitive element (thermal transducer) 14 having conductive strips 20.4 attached to terminals (conductive pads) 20.3 to provide an electrical contact between the transducer and the pads.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to add conductive strips, as taught by Padovani, to the device disclosed by Boutaghou, so as to provide an electrical contact, as already suggested by Padovani, between the transducer(s) and pads in order to convey an electrical signal further to a processing circuit, as already suggested by Padovani.

8. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Boutaghou as applied to claims 9-11, 14-16, 23, 25, 27 above, and further in view of Flechsig et al. [hereinafter Flechsig].

Boutaghou discloses a device as stated above in paragraphs 5.

Boutaghou does not explicitly disclose grounding of the thermal transducers as stated in claim 12.

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Flehsig discloses in Fig. 9 a port 120 to which a sensor 91 is grounded.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to electrically ground transducers disclosed by Boutaghou to a ground port, as taught by Flehsig, in order to stabilize or limit the voltage to ground.

Official Notice is taken with respect to having a common electrical ground as stated in claim 12 since it is very well known in the art to electrically ground transducers in the same circuitry or device to the same (common) electrical ground conductor in order to minimize the number of lines having "0" potential in the same circuitry and, thus, to minimize noise-to-signal ratio.

9. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Boutaghou '184 as applied to claims 9-11, 14-16, 23, 25, 27 in view of Nguyen et al. [hereinafter Nguyen].

Boutaghou discloses the device as stated above in paragraphs 5.

Boutaghou does not explicitly disclose the limitations of claim 20.

Nguyen discloses a device comprising a thin film transducer 28 mounted on a rail 24 mounted on an ABS 23 or 24 (col. 2, lines 36-48).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to make the MR sensors in the device disclosed by Boutaghou of a thin film,



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as taught by Nguyen, so as to decrease weight of the transducers, and thus, to improve an accuracy of asperity detection.

10. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Boutaghou as applied to claims 9-11, 14-16, 23, 25, 27 above in view of Ishimaga et al. (U.S. 6234599) [hereinafter Ishimaga].

Boutaghou discloses the device as stated above in paragraph 5.

Boutaghou does not disclose the limitations of claim 24.

Ishimaga teaches (col. 30, line 52) a temperature sensor (transducer) covered with a protective layer.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to add a protective layer to the transducers disclosed by Boutaghou, as taught by Ishimaga, so as to protect the transducers from undesirable contacts in order to improve an accuracy of the detection.

11. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later

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invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

***Response to Arguments***

12. Applicant's arguments filed on September 11, 2002 have been fully considered but they are not persuasive.

A) Applicant states that the transducers of the present invention provide a relatively large contact area to contact a thermal asperity, and having a thickness portion, as opposed to the transducers disclosed by Boutaghou. Applicant also states that the (conventional) MR sensors formed along the leading edge having an edge or thin portion oriented along the ABS do not provide a desired contact interface, while, the sensor of the present invention is located on the raised surface provides a larger contact. This argument is not persuasive because: a) the limitation on which the Applicant relies are not stated in the claims. It is the claims that define the claimed invention, and it is claims, not specifications that are anticipated or unpatentable. Constant v. Advanced Micro-Devices, Inc., 7 USPQ2d 1064.

b) the sensor of Boutaghou is located on a raised ABS, please refer to paragraph # 3 of the Office Action.

B) Applicant states that the sensor of the present invention has a surface portion and not a thickness portion oriented along the raised bearing. This argument is not persuasive because, as

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shown in Figs. 1-4 and 13, the MR of Boutaghou inherently has a surface (contact) portion and a thickness portion (height) and contacts the ABS with the surface portion.

C) With respect to claim 16: Applicant states that claim 16 was rejected on the basis that the ABS was configured prior to the deposition process. This argument is not persuasive, because the limitation (the particular sequence, i.e., prior or after) on which Applicant relies on is not claimed in claim 16. It is the claims that define the claimed invention, and it is claims, not specifications that are anticipated or unpatentable. Constant v. Advanced Micro-Devices, Inc., 7 USPQ2d 1064.

D) Applicant states that it is not inherent that the thickness of the transducer intersects a portion extending along the ABS. As best interpreted by the Examiner, the thickness of the thermal transducer is a height of the transducer, the portion extending along the ABS is a length of the transducer. It is very well known in the art that at least at one point, the height of a structure should intersect (contact) the length of the same structure.

E) Applicant states that MR transducers (of Boutaghou) provide a thin flat thickness asperity contact surface (as opposed to the present invention). This argument is not persuasive because, even being thin and flat, the MRs of Boutaghou still inherently have an ABS contacting surface portion and a thickness portion (height).

F) With respect to claims 25, 27: Applicant states that in Boutaghou, the transducers are not formed on the raised surface. This argument is not persuasive, because, as shown in Fig. 2,

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the raised surface of the ABS is a rail and the transducers are formed on the rail (raised surface).

Also, please refer to paragraph # 3 of the Office Action.

G) With respect to claim 26: applicant states that Yura does not teach a step of fabricating an ABS, etc., as stated by the present invention and has no suggestion to combine (modify) Boutaghou. This argument is not persuasive because: a) the examiner recognizes that references cannot be arbitrarily combined and that there must be a reason why one skilled in the art would be motivated to make the proposed combination of primary and secondary references. *In re Nomiya*, 184 USPQ 607 (CCPA 1975). However, there is no requirement that a motivation to make the modification be expressly articulated. The test for combining references is what the combination of disclosures taken as a whole would suggest to one of ordinary skill in the art. *In re McLaughlin*, 170 USPQ 209 (CCPA 1971). The references are evaluated by what they suggest to one versed in the art, rather than by their specific disclosures. *In re Bozek*, 163 USPQ 545 (CCPA) 1969. In this case, a) Yura does not teach a step of fabricating of the ABS but the combination of Boutaghou and Yura does, b) in the rejection on the merits, the Examiner is only using the teaching of Yura that the wafer can be sliced after the deposition process.

H) With respect to claims 7 and 12: the arguments are not persuasive because, applicant refers to claim 1, however, claim 1 has been previously canceled, and claims 7 and 12 are dependent on claims 6 and 11 respectively.

I) With respect to claim 24: please refer to the rejection on the merits of claim 2, paragraph # 3 of the Office Action.

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J) With respect to claim 20: Applicant states that Nguyen does not teach the present invention, i.e., the steps of fabricating a raised ABS and depositing thermal transducers. However, in the rejection on the merit, only the statement that the transducer can be a thin film transducer, is used by the Examiner.

***Allowable Subject Matter***

13. Claims 13, 18, 21 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Conclusion***

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The prior art cited in the PTO-892 disclose related devices.

15. Any inquiry concerning this communication should be directed to the examiner Verbitsky whose telephone number is (703) 306-5473.

Any inquiry related to the status of this application should be directed to the Group Receptionist whose telephone number is (703) 308-0956.

GKV

November 26, 2002

Gail Verbitsky



Patent Examiner, TC 2800

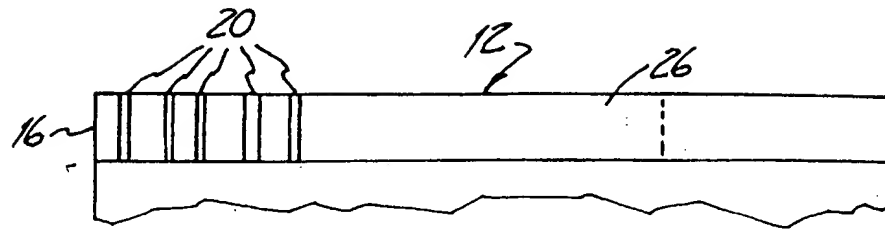


Fig. 11

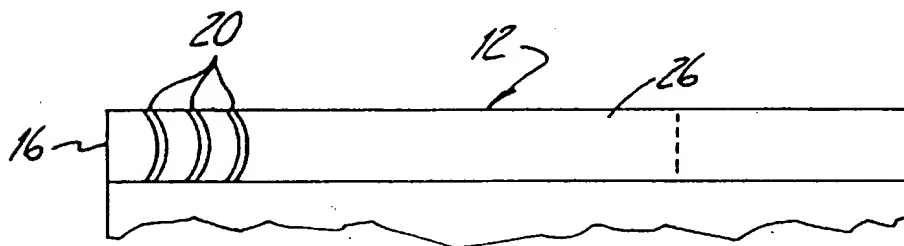


Fig. 12

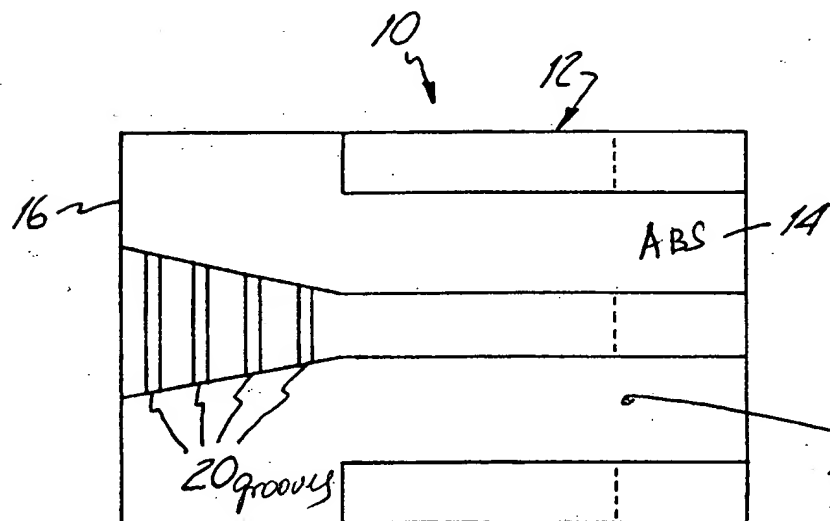


Fig. 13

